

IN THE CLAIMS

Please cancel [✓]claims 1-30 without prejudice or disclaimer and substitute the following new claims 31-96 therefor as follows:

A4 ✓ 31. (New) A device for monitoring micropollutants in an aquatic environment, which device comprises:

(a) a diffusion-limiting membrane capable of being in contact with the aqueous environment when the device is in use and adapted to allow rate-limited diffusion therethrough of the micropollutants; and,

(b) separated from the aqueous environment by the membrane, a receiving phase having a sufficiently high affinity for the micropollutants for receiving and retaining the micropollutants

characterised in that the receiving phase comprises an immobilised solid phase material supported by a solid support.

✓ 32. (New) A device according to claim 31, wherein the solid support is in the form of a solid carrier for the solid phase material, which does not contain or retain water within its structure and can not exchange water with its environment, whereby the solid support is not subject to loss of water and hence changes in dimension, due either to evaporation or osmotic efflux.

✓ 33. (New) A device according to claim 31, wherein the diffusion-limiting membrane comprises a solid, hydrophobic material, which contains less

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than 1% water and/or is substantially non-porous, whereby the diffusion pathway comprises the solid polymer itself and not any water contained therein.

→ 34. (New) A device according to claim 31, wherein the diffusion-limiting membrane comprises polyethylene.

✓ 35. (New) A device according to claim 31, suitable for monitoring polar, organic micropollutants, wherein the membrane is selected from polysulphone, polycarbonate, cellulose dialysis membrane, PTFE, PVDF and glass fibre.

→ 36. (New) A device according to claim 31, suitable for monitoring inorganic micropollutants, wherein the membrane is selected from (cellulose acetate, glass fibre membranes, nylon membranes and dialysis membranes.)

✓ 37. (New) A device according to claim 31, wherein the diffusion-limiting membrane is or is associated with a molecular charge selective material.

→ 38. (New) A device according to claim 37, wherein the molecular charge selective material is selected from (poly(4-vinylpyridine), poly(2,6-dimethylphenol) and perfluorinated polymers having pendant sulphonic acid groups.)

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39. (New) A device according to claim 31, wherein the thickness of the membrane, and therefore diffusion pathway, is in the range of from 0.02 to 0.15 mm.

40. (New) A device according to claim 39, wherein the thickness of the membrane, and therefore diffusion pathway, is less than 0.1 mm.

41. (New) A device according to claim 31, wherein the thickness of the receiving phase is less than 1 mm.

42. (New) A device according to claim 31, wherein the solid receiving phase is in the form of a cartridge or disk. fig (2)

43. (New) A device according to claim 31, wherein the immobilised solid phase material comprises C₈ to C₁₈ chain length hydrocarbon groups bonded in a silica-based polymer. 10/4. lines 24-28

44. (New) A device according to claim 31, wherein the solid support comprises a matrix of fibres.

45. (New) A device according to claim 44, wherein the matrix of fibres comprises hydrophobic fibres.

46. (New) A device according to claim 31, wherein the face of the membrane remote from the receiving phase is provided with netting or a mesh. fig (2)

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47. (New) (A unit for use as a passive sampling device) which unit comprises a device according to claim 31, and an inert body adapted to allow insertion therein and removal therefrom of the solid receiving phase and adapted to allow access from the aqueous environment of the micropollutants to the membrane.

/48. (New) A unit according to claim 47, provided with removable means for enabling water or conditioning liquid to be maintained in contact with the solid receiving phase between preparation and use of the device.

49. (New) A unit according to claim 48, wherein the unit and/or removable means comprise(s) PTFE.

50. (New) A method for monitoring micropollutants in a polluted environment, which method comprises:

(a) providing a receiving phase comprising an immobilised solid phase material for the micropollutants, which material is supported by a solid support;

fig(2)

(b) providing a diffusion-limiting membrane adapted to allow rate-limited diffusion therethrough of the micropollutants and, in use, adapted to separate the receiving phase from the polluted environment;

col. 5 P(2) fig(2)

(c) bringing the membrane into contact with the polluted environment for a sufficient period of time to allow the micropollutants to collect in the immobilised solid phase material;

fig(2)

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(d) removing the solid receiving phase from the environment; and

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(e) analysing the micropollutants accumulated in the receiving phase.

51. (New) A method according to claim 50, wherein, in step (d), the solid receiving phase is removed from the environment and separated from the device.

col 5 ¶ 2 fig(2)

52. (New) A method according to claim 50, wherein the step (e) comprises applying extraction solvent to the receiving phase, whereby the analytes are removed from the receiving phase.

53. (New) A method according to claim 52, wherein the extraction solvent is applied to one face of the receiving phase and is collected, containing the micropollutant analyte(s), at the opposite face thereof.

54. (New) A method according to claim 50, which further comprises pre-treating the receiving phase by coating or impregnating it with the diffusion-limiting membrane; by conditioning it with a conditioner; or by loading it with internal standard; or any combination thereof.

55. (New) A method according to claim 50, which further comprises pre-treating the receiving phase by treating it with an agent adapted to complex, chelate or otherwise assist the receiving phase to receive and retain the chosen micropollutant.

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56. (New) A method according to claim 50, which further comprises pre-treating the receiving phase by coating or impregnating it with a photometric agent selected from bathocuproine, methylthymol blue, xylenol orange, glycine cresol red, binchinonic acid and 1,5-diphenyl carbohydrazide.

57. (New) A method according to claim 50, which further comprises pre-treating the receiving phase by coating or impregnating it with an internal standard comprising an isotopically-labelled compound, capable of, during deployment of the device, diffusing from the receiving phase through the diffusion-limiting membrane and into the aquatic environment at a known and controlled rate.

58. (New) A device for monitoring non-polar, organic micropollutants in an aquatic environment, which device comprises:

(a) a diffusion-limiting membrane capable of being in contact with the aqueous environment when the device is in use and adapted to allow rate-limited diffusion therethrough of the micropollutants; and,

(b) separated from the aqueous environment by the membrane, a receiving phase having a sufficiently high affinity for the micropollutants for receiving and retaining the micropollutants

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characterised in that the receiving phase comprises an immobilised solid phase material and the diffusion-limiting membrane comprises a solid, hydrophobic polymeric material capable of determining rate of diffusion of the micropollutants therethrough.

59. (New) A device according to claim 58, wherein the immobilised solid phase material is supported by a solid support.

60. (New) A device according to claim 59, wherein the solid support is in the form of a solid carrier for the solid phase material, which does not contain or retain water within its structure and can not exchange water with its environment, whereby the solid support is not subject to loss of water and hence changes in dimension, due either to evaporation or osmotic efflux.

61. (New) A device according to claim 58, wherein the diffusion-limiting membrane comprises a solid, hydrophobic material, which contains less than 1% water and/or is substantially non-porous, whereby the diffusion pathway comprises the solid polymer itself and not any water contained therein.

62. (New) A device according to claim 58, wherein the diffusion-limiting membrane comprises polyethylene.

63. (New) A device according to claim 58, suitable for monitoring polar, organic micropollutants, wherein the membrane is selected from

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polysulphone, polycarbonate, cellulose dialysis membrane, PTFE, PVDF and glass fibre.

64. (New) A device according to claim 58, suitable for monitoring inorganic micropollutants, wherein the membrane is selected from cellulose acetate, glass fibre membranes, nylon membranes and dialysis membranes.

65. (New) A device according to claim 58, wherein the diffusion-limiting membrane is or is associated with a molecular charge selective material

66. (New) A device according to claim 65, wherein the molecular charge selective material is selected from poly(4-vinylpyridine), poly(2,6-dimethylphenol) and perfluorinated polymers having pendant sulphonic acid groups.

67. (New) A device according to claim 58, wherein the thickness of the membrane, and therefore diffusion pathway, is in the range of from 0.02 to 0.15 mm.

68. (New) A device according to claim 67, wherein the thickness of the membrane, and therefore diffusion pathway, is less than 0.1mm.

69. (New) A device according to claim 58, wherein the thickness of the receiving phase is less than 1mm.

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✓ 70. (New) A device according to claim 58, wherein the solid receiving phase is in the form of a cartridge or disk.

71. (New) A device according to claim 58, wherein the immobilised solid phase material comprises C₈ to C₁₈ chain length hydrocarbon groups bonded in a silica-based polymer.

✓ 72. (New) A device according to claim 59, wherein the solid support comprises a matrix of fibres.

73. (New) A device according to claim 72, wherein the matrix of fibres comprises hydrophobic fibres.

✓ 74. (New) A device according to claim 58, wherein the face of the membrane remote from the receiving phase is provided with netting or a mesh.

✓ 75. (New) A unit for use as a passive sampling device, which unit comprises a device according to claim 58, and an inert body adapted to allow insertion therein and removal therefrom of the solid receiving phase and adapted to allow access from the aqueous environment of the micropollutants to the membrane.

76. (New) A unit according to claim 75, provided with removable means for enabling water or conditioning liquid to be maintained in contact with the solid receiving phase between preparation and use of the device.

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77. (New) A unit according to claim 75, wherein the unit and/or removable means comprise(s) PTFE.

78. (New) A device for monitoring micropollutants in an aquatic environment, which device comprises:

(a) a diffusion-limiting membrane capable of being in contact with the aqueous environment when the device is in use and adapted to allow rate-limited diffusion therethrough of the micropollutants; and,

(b) separated from the aqueous environment by the membrane, a receiving phase having a sufficiently high affinity for the micropollutants for receiving and retaining the micropollutants

characterised in that the receiving phase comprises an immobilised solid phase material, and the diffusion-limiting membrane comprises pores traversing the membrane in a direction substantially at right angles to the plane of the membrane and having a diameter in the range of from 0.1 to 10 μm .

79. (New) A device according to claim 78, wherein the immobilised solid phase material is supported by a solid support.

80. (New) A device according to claim 79, wherein the solid support is in the form of a solid carrier for the solid phase material, which does not contain or retain water within its structure and can not exchange water with its environment, whereby the solid support is not subject to loss of

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water and hence changes in dimension, due either to evaporation or osmotic efflux.

81. (New) A device according to claim 78, wherein the diffusion-limiting membrane comprises a solid, hydrophobic material, which contains less than 1% water and/or is substantially non-porous, whereby the diffusion pathway comprises the solid polymer itself and not any water contained therein.

82. (New) A device according to claim 78, suitable for monitoring polar, organic micropollutants, wherein the membrane is selected from polysulphone, polycarbonate, cellulose dialysis membrane, PTFE, PVDF and glass fibre.

83. (New) A device according to claim 78, suitable for monitoring inorganic micropollutants, wherein the membrane is selected from cellulose acetate, glass fibre membranes, nylon membranes and dialysis membranes.

84. (New) A device according to claim 78, wherein the diffusion-limiting membrane is or is associated with a molecular charge selective material.

85. (New) A device according to claim 84, wherein the molecular charge selective material is selected from poly(4-vinylpyridine), poly(2,6-dimethylphenol) and perfluorinated polymers having pendant sulphonic acid groups.

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86. (New) A device according to claim 78, wherein the thickness of the membrane, and therefore diffusion pathway, is in the range of from 0.02 to 0.15 mm.

87. (New) A device according to claim 86, wherein the thickness of the membrane, and therefore diffusion pathway, is less than 0.1mm.

88. (New) A device according to claim 78, wherein the thickness of the receiving phase is less than 1mm.

89. (New) A device according to claim 78, wherein the solid receiving phase is in the form of a cartridge or disk.

90. (New) A device according to claim 78, wherein the immobilised solid phase material comprises C₈ to C₁₈ chain length hydrocarbon groups bonded in a silica-based polymer.

91. (New) A device according to claim 79, wherein the solid support comprises a matrix of fibres.

92. (New) A device according to claim 91, wherein the matrix of fibres comprises hydrophobic fibres.

93. (New) A device according to claim 78, wherein the face of the membrane remote from the receiving phase is provided with netting or a mesh.

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94. (New) A unit for use as a passive sampling device, which unit comprises a device according to claim 78, and an inert body adapted to allow insertion therein and removal therefrom of the solid receiving phase and adapted to allow access from the aqueous environment of the micropollutants to the membrane.

95. (New) A unit according to claim 94, provided with removable means for enabling water or conditioning liquid to be maintained in contact with the solid receiving phase between preparation and use of the device.

96. (New) A unit according to claim 95, wherein the unit and/or removable means comprise(s) PTFE.

REMARKS

The above-identified application has been amended to correct minor typographical errors in the specification, cancel pending claims 1-30 and add new claims 31-96. An amended form of lines 21-29 on page 30, and lines 1-16 on page 31, and lines 3-6 and lines 9-13 on page 39 is attached for the Examiner's convenience pursuant to rule 37 C.F.R. § 121.(c)(1)(ii). This paper is not intended to be entered.

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